

THE ZOOLOGIST

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THE LATE LORD LILFORD, F.L.S., F.Z.S.

President of the British Ornithologists' Union.

THE unexpected death of this distinguished naturalist and sportsman, which took place at Lilford Hall, near Oundle, Northamptonshire, on June 17th, has evoked a universal expression of concern and regret wherever it has been made known. Those only who were privileged to know him intimately, and for many years, can alone rightly appreciate his worth, and understand how widely his loss will be felt by those who shared his taste for natural history, especially ornithology, and his life-long devotion to field sports.

His keenness for the outdoor observation of birds and beasts made itself manifest at a very early age, for even as a boy at Harrow in the fifties he commenced to write letters to the editor of 'The Zoologist' which embodied many interesting facts that have proved useful to subsequent writers of local faunas.

Born in 1833, the Hon. Thomas Lyttleton Powys was only seventeen years of age when as a Harrow boy he began to write for 'The Zoologist'; and from the nature of the observations which he communicated to this Journal from 1850 onwards, it is clear that he lost no opportunity of recording the occurrence of such uncommon birds as came under his notice wherever he happened to be—at home in Northamptonshire, at Harrow in 1850–51, at Oxford (Christchurch) in 1852, on the Devonshire coast during summer vacations, or on the Continent.

Some of these early observations were turned to good account in after years, when, as an experienced ornithologist, he began to generalize from the records he had amassed, and commenced to write the text for his beautiful work on British Birds, and his two delightful volumes on the 'Birds of Northamptonshire.' As an example of the way in which some of his early notes were turned to account in after years, we may refer to what he has written of the Red-backed Shrike ('Birds of Northamptonshire,' vol. i. p. 76), which in his schooldays was so abundant in the neighbourhood of Harrow, that he used "often to find two or three nests on a summer's afternoon in the thick and ragged fences that divided the great grass fields of that district." Forty-five years later it had become quite uncommon there, doubtless from the growing practice of "plashing" the tall hedgerows, which deprived these birds of their favourite haunts.

When in 1859 the British Ornithologists' Union was founded by a few enthusiasts, who undertook the publication of a quarterly journal of ornithology, yclept 'The Ibis,' Lord Lilford's name soon appeared as a contributor to its pages. In the volume for 1860, for example, we find an excellent article from his pen on the birds observed by him in the Ionian Islands and the provinces of Albania Proper, Epirus, Acarnania, and Montenegro.* Again, in the volumes for 1865 and 1866, we find a valuable series of articles by him on the ornithology of Spain,† to which country he made occasional visits at intervals, and did much to enlighten English naturalists on the fauna, and more especially the avifauna, of a country concerning which little, zoologically speaking, was then known. We do not doubt that these papers of his paved the way for the more complete investigation of the Spanish fauna which has since been so admirably carried on by Lieut.-Col. Irby, Mr. Howard Saunders, and Mr. Abel Chapman. Perhaps the most delightful of the articles contributed by him to the pages of 'The Ibis' is his "Cruise of the 'Zara,' R.Y.S., in the Mediterranean." This cruise was undertaken between December, 1873, and June, 1874, and shows, as the author himself stated (*tom. cit.* p. 2), "how much may be done comparatively near home, even by a naturalist so incapacitated by lameness as

* 'The Ibis,' 1860, pp. 1-19, 133-140, 228-239, 338, &c.

† 'The Ibis,' 1865, pp. 166-177; 1866, pp. 173-187, 377-392.

myself." The fact is that at that date he was already suffering from rheumatic gout, as he tells us (p. 4), which sometimes laid him up for weeks at a time, and which, a few years later, eventually confined him almost entirely to the house. To such an ardent sportsman as he was, indulging at one time in Otter-hunting, Grouse-shooting, and Deer-stalking, when he rented Gaick Forest, by Kingussie, in the Badenoch district,* and had the run of 12,000 acres of fine stalking-ground, this enforced confinement to the house must have been most irksome and wearisome. And yet with what patience he supported the trial is well known to those who, like the present writer, visited him in his charming Northamptonshire home,† and noted with admiration the many ways in which a well-stored mind could relieve the tediousness of time. Had he lived earlier in the century, Sir Walter Scott might well have had his case in view when he penned his "Lay of the Imprisoned Huntsman":—

" My hawk is tired of perch and hood,
My idle greyhound loaths his food,
My horse is weary of his stall,
And I am sick of captive thrall."

The allusion to the hawk would, in his case, have been a happy one, for no one was more enthusiastic on the subject of falconry, no one more anxious to uphold the practice of that ancient sport. As a member of the "Old Hawking Club" he set a good example in this respect, and with the assistance of the veteran falconer Paul Mollen, and R. Cosgrave, he trained and flew many a good falcon and goshawk. Of some of these flights the present writer was an eye-witness, and the treat which he experienced in examining the splendid collection of living birds of prey at Lilford Hall will never be effaced from his memory.‡ Seven different kinds of Eagles, eight or nine species of Owls, Buzzards, Falcons and Hawks, and a pair of Kites in an aviary,

* An excellent photogravure of Gaick Forest Lodge is given in Grimble's 'Deer Forests of Scotland,' recently published.

† A view of Lilford Hall forms the frontispiece to vol. i. of 'The Birds of Northamptonshire.'

‡ On one occasion, in December, 1891, a curious flight was witnessed. A goshawk named "Barbara," belonging to Lord Lilford, suddenly turned from a rabbit she was chasing, and pursued and captured a Barn Owl!

large enough and lofty enough to admit of their flying round and round, spreading their great forked tails, afforded a spectacle not easily to be forgotten. Nor should we omit to mention the unique sight of a pair of Lammergeiers, which might be seen "flying at hack" in unrestrained freedom within sight of the house. To see a Lammergeier on the wing in England would be a sight for which any ornithologist would willingly undertake a long journey.

Nor is the collection of live birds at Lilford Hall confined merely to birds of prey. The out-of-door aviaries contain Bustards, Storks, Cranes, Herons, Spoonbills, Ibises, and Waterfowl of all kinds, in the highest perfection of plumage, which indicates their enjoyment of health arising from the natural conditions under which they have been maintained.

The reader who would know more of these wonderful aviaries should peruse an article on the subject from the pen of the late owner which will be found printed in the 'Transactions of the Norfolk and Norwich Naturalists' Society,' 1890-91 (pp. 128-143), and is full of interesting information.

In this article Lord Lilford has referred (p. 129) to his "excellent friend and teacher in falconry, the late E. Clough Newcome, of Feltwell, the first practical falconer of his day, and a very acute field ornithologist." Allusion is also made (p. 132) to the fact that "Peregrines have been taken at Lilford alive and uninjured, in the recognised Dutch fashion with bow-net and decoy pigeons, and the almost indispensable assistance of a Great Grey Shrike as sentinel."

The latest information of interest concerning the live birds in these beautiful aviaries was communicated by Lord Lilford, in a letter dated May 23rd, which is published in the current number of 'The Ibis' for July. It relates to the breeding in confinement of the Australian Wattled Lapwing, *Sarciophorus pectoralis*, and the pairing of one of their progeny with a Cayenne Lapwing, *Vanellus cayennensis*, resulting in the successful hatching of two young birds. The letter further contains some interesting details concerning the deposition of an egg by a Kiwi (*Apteryx oweni*) in a hole made in the bank of a pond, and the successful breeding of a pair of Burrowing Owls (*Speotyto cunicularia*).

In the same spirit of enthusiasm which prompted him to

encourage every branch of sport, even though prevented at times from taking an active part in it—we have known him to attend a meet of the Otter-hounds in his Bath chair—he commenced, in 1885, the construction of a decoy at Aldwinckle, not far from his home, under the direction of Gilbert Skelton, one of an ancient family of decoymen who came from Friskney, in Lincolnshire.* This decoy is triangular in form, and has three pipes, one at each corner. It is situated in the valley of the Nene, at a spot likely to be attractive to wildfowl, which not only pass over this valley in large numbers, but also rest there on their migration, especially when the river is in flood. In this spot Lord Lilford has seen from 1000 to 2000 wildfowl on the low lands, when the water is out along the course of the Nene, and has obtained almost every kind of duck there, including Gadwall. Spotted Rail and Water Rail also have been snared in the decoy.†

In the direction of the acclimatisation of exotic game-birds mention should be made of the experiment carried out by Lord Lilford to introduce the Virginian Colin (*Ortyx virginianus*) into Northamptonshire. A considerable number of these birds were imported by him and turned out, but, for reasons which he has stated ('Birds of Northamptonshire,' vol. i. p. 300), the experiment was not regarded as very successful. Some Long-eared Owls were turned out by him in a suitable locality, and established themselves under his protection (Zool. 1895, p. 47), as was likewise the case with the Little Owl (*Athene noctua*), several of which were turned out at Lilford Hall, in July, 1888 (cf. Zool. 1889, p. 426; 1891, p. 46; 1892, p. 90).

Of the great encouragement given by the deceased nobleman to the study and advancement of ornithology it is almost unnecessary to speak; his liberality in that direction to the Zoological Society of London, the Northamptonshire Natural History Society, and the British Ornithologists' Union, of which he was for many years President, being well known to all interested in such pursuits.

* Of this remarkable family, various members of which have constructed or remodelled nearly all the best decoys in the country, some account is given by Sir R. Payne Gallwey, in his 'Book of Duck Decoys,' 1886, pp. 12-14.

† For remarks on the wildfowl seen at this decoy see the "Notes on the Ornithology of Northamptonshire," 'Zoologist,' 1891, pp. 41-42; 1892, p. 202; 1893, pp. 89-90; 1894, p. 211; 1895, p. 48.

His published works, especially his beautiful 'Illustrations of British Birds,' and his recently issued volume on the birds of his own county, testify abundantly to his keen power of observation, and his excellent judgment as a writer on ornithology. His loss will be deplored, not only by the learned societies of which he was so distinguished a member, but by a very large circle of friends and acquaintances to whom he had endeared himself by an unfailing kindness of heart and constant readiness to help.

He passed peacefully away at the age of sixty-three, surrounded, as was fitting, by all that he loved best in his beautiful home in Northamptonshire. Here he had chiefly resided for many years past, though he also owned a fine property in Lancashire, in addition to the lands of the Fox family, to which he succeeded in Wiltshire, and at St. Anne's Hill, Chertsey, the former abode of Charles James Fox. These two estates he inherited respectively from his aunt, the last Lady Holland, and his brother the Hon. Leopold Fox Powys, who died about three years ago. He was a son of the third Baron Lilford, his mother being a daughter of the third Lord Holland, a most charming old lady, whom it was the writer's privilege to know when she resided in London. Lord Lilford married for his first wife Miss Brandling, of Low Gosforth, Northumberland, who died in 1885, and whose son, the Hon. John Powys, succeeds him in the title. With his second wife, who survives him (a daughter of Mr. Ker Baillie Hamilton), all who had the privilege of knowing him will sympathise in the loss which she, and they, have sustained by his death.

The accompanying portrait is reproduced, by permission of the publishers, from 'Black and White.'

ORNITHOLOGICAL NOTES FROM ROMNEY MARSH AND ITS NEIGHBOURHOOD.

By BOYD ALEXANDER.

"TIMES are not as they were" is a saying that might well be applied to this district as regards the numerical distribution of species of birds now breeding there, as compared with formerly. Disturbing influences of one kind and another have come about which have sadly thinned their number. Indeed, in the case of

the Kentish Plover and Thickknee, it well nigh approaches extinction, since the "Lydd Beach," the breeding resort of these species and of several others, has long been threatened. In his 'Birds of East Kent,' Mr. George Dowker thus describes the "Lydd Beach":—"This extraordinary accumulation of stones is not only the home of many rare birds, but is a perfect wilderness, while a fauna and flora are found which are nowhere else to be met with in the South-eastern corner of England. The beach, which has been accumulating round Dungeness for many centuries, is upwards of three miles in width at its broader part, a stony desert relieved here and there by large ponds" (p. 36). This locality can hardly at the present time be described as a "wilderness," or "the home of many rare birds."

The direct causes may be attributed to the increased firing of both artillery and small arms during the height of the breeding season, and also to the Dungeness railway, which has opened out a considerable portion of it. On the other hand, there are portions of the shore-line, between Pevensey and Dungeness, quite as rich as they were in the days of Knox in the visits of summer migrants that pass northwards to breed.

On May 9th a female Temminck's Stint was obtained on the Pevensey Levels, and during the following day a number of Bar-tailed Godwits appeared near Rye Harbour. Several were shot. The last of the Godwits were seen on May 28th, when a party of five immature birds alighted on the sands at low water. One of these, a male, was shot. This bird was still assuming the pale plumage.

Several Grey Plovers, with black breasts, were also obtained on May 10th, and individuals of this species continued to arrive on and off up to June 13th, when I saw two of them in company with a Knot on the Midrips.* By the next day, however, all three had disappeared. On May 22nd a flock of six passed over my head. They were making in a northerly direction.

A pair of Black-tailed Godwits appeared on May 18th on the Pevensey Levels. This seems somewhat a favourite spot for these birds. A pair were obtained in the same place last year on May 11th. The Pevensey Levels are also mentioned by Knox in regard to the occurrence of this species in Sussex. From May

* These are a series of shallow ponds on the "Lydd Beach."

15th onwards a number of young Herons, covered with undeveloped quills, continually invaded the dykes and shallow pools here* in search of eels. This is frequently the case during a dry season like the present one, when the water has become low. These birds must chiefly hail, I think, from the heronry at Brede. On these partial migrations in search of food many are shot by the farmers, who esteem them good eating.

The breeding numbers of the Redshank have decidedly diminished here. Increased drainage and the dry weather of the last two summers have done a great deal towards the banishment not only of this species, but especially of the Coot and Little Grebe.

Many parts of the large dykes and pools that were only a few years back favourite breeding resorts of these birds have dried up and are now nothing more than thick reed-beds. In these "reedy" places the Reed Warbler has found a home. Any sudden noise will cause this bird to sing vehemently, while the footfalls of a passer-by invariably draw from him a song.

The Little Grebe is locally known as "Spider Diver." When considering the decrease of the Redshank, the taking of their eggs by the country people for eating must not be lightly disregarded. The immediate locality of the nest is soon discovered, for no bird, with the exception of the Lapwing, betrays the whereabouts of its nest more readily than does the Redshank. It flies overhead in concentric circles uttering alarm-notes, which are for all the world in tone like a string of plaintive sobs that become wilder and more heartrending as the nest is approached. A short search will soon find the eggs.

On May 22nd a pair of Thickknee Plovers appeared on the "Lydd Beach." After carefully watching them for some days I was rewarded in finding their two eggs. They were deposited amongst some flowering foxglove—altogether a pretty site—but all the same unhappily selected, since the locality was continually being subjected to a "dropping" artillery fire. I had hopes of being able to see the young, but after four days of sitting the birds deserted the nest. The extraordinary sense of smell possessed by the Thickknee renders a near approach to the nest without disturbing the bird difficult.

* "Here," in this article, refers to the Lydd Beach and its immediate neighbourhood.

Of the two species of Terns breeding here, the Common and Lesser, the latter is by far the more numerous. But the numbers of both have sadly diminished of late years. Both species keep separate in their breeding haunts, the Lesser Tern preferring rather the close proximity of the sea. The restricted breeding area taken up by the Common Terns is distinctly prejudicial to the safety of their eggs. The children of the fishermen and coast-guard officers soon discover these spots, and the eggs are robbed right and left for purposes of eating. Over these places sheep have invariably been feeding, and where they have poked their noses, forming small stone-padded hollows, the eggs are more often than not laid. On May 21st a nest of the Common Tern was found containing five eggs. They were of the reddish-buff variety.

On May 23rd I was fortunate enough to discover, with the aid of my field-glasses, a pair of Sandwich Terns breeding here. The birds, however, deserted after the first egg was laid. I am inclined to think that the Common Terns must have driven them away.

A pair of Black Terns were seen on May 24th, following the sea-board.

The sandy portions of the Rye coast attract now and again a certain number of Oystercatchers. They are more numerous, however, in the autumn than on the spring migration. When going northwards to breed, the Oystercatcher makes a rapid journey, rarely tarrying for any length of time by the way like other members of the *Scolopacidae*. At 5.30 on May 29th six of these birds appeared here. They "shelved" on to the sand, and immediately "made for" shelter along the nearest groyne. They "bunched" themselves up together and remained almost motionless for nearly an hour, after which they aroused themselves and began to dabble in the nearest pools. Shortly before seven o'clock one of the birds—presumably the leader—uttered its call-note, whereupon the little flock formed once more in close order and got up like one bird, making in a north-westerly direction. A solitary pair of these birds may be found breeding annually on the beach not far from Dungeness. But it is doubtful whether any young are ever reared.

The presence here of the Wheatear can hardly escape the notice of the most unobservant. The curious sites chosen by these birds for their nests—and especially is this the case down

here—is no safeguard against intrusion, but rather, if anything, the exact opposite, for it seems to linger in the memory of the birdnesting boy, with the result that every tin can, kettle, and empty shell is zealously turned over and examined, when the Wheatear's treasure is very often found. Though the first nest be taken, it is not uncommon to find the same site occupied again for the second lay. I came across a nest on the "Lydd Beach," this summer, under a turned-over pig-trough. The hole by which the bird gained access to its nest was no larger than that of a mouse. Another was found in an empty four-pounder shell—a good example truly of "peace and war." The crevices in the gabion casemates here are also frequently chosen. Again, it is not unusual here to find the Wheatear's nest in a depression on the bare beach. In a case like this, dry grass alone is used, the nest resembling then a large edition of the Lark's. The normal feather-lining is absent, and in this way conspicuousness is nicely avoided. If not disturbed, I fancy the Wheatear returns annually to the same nesting-site.

The Ringed Plover breeds on the "Lydd Beach" in fair numbers, and seems to be the least affected of its genus by the artillery practice. These noisy little birds course over the beach all day long, uttering their whistling cries. Even the Skylarks of the locality have caught their plaintive notes, and they produce them amongst their own with startling exactitude.*

Four pairs of Kentish Plover bred on the beach not very far from Dungeness Lighthouse. The nest of this species is, to my mind, by far the most difficult to find of all the Plovers. The bird seldom makes any demonstration in the way of a call-note; it creeps away like a mouse through the dry beach-grass, which it resembles so closely in colour. To lie down flat on the beach, armed with a good pair of glasses, is the only chance of success, and then one may be rewarded by seeing a little brown thing wending its way back to its nest, stopping now and again, and when in close proximity to its treasure standing motionless for many minutes together. When the eggs are hatched the bird is even still more wary. It often drops the food close to the young without even alighting. I have found that the male alone of this species undertakes the task of incubation.

* See Witchell, 'Evolution of Bird Song,' 1896, p. 209.

On May 29th the first flock of Sanderlings appeared. They were in full summer dress. The female of this species seems more backward in assuming the nuptial dress than the male. A female out of this flock was obtained with plumage hardly differing from that attained in autumn. The resemblance in the markings of the crown, nape, and mantle, and especially the latter, of the male Dunlin, and Sanderling, in summer dress, is very remarkable. The last flock of Sanderlings was seen here on June 2nd.

A pair of Dotterel appeared here on May 29th, a rather late date for this species. They remained in a field of young peas close to the shore for several days.

On May 30th two pairs of Common Sandpipers came to one of the dykes, but disappeared a few days later. I have searched in vain for the nest of this species in many portions of Kent, and have carefully watched the birds, but they never remained for any length of time in one locality. Knox, in his 'Ornithological Rambles' (p. 231), says that this bird "is frequently met with on the banks of inland streams, among the grassy borders of which the nest is placed." This can hardly be taken as evidence of this species having nested, even in Sussex, during his day. The breeding haunts of the Common Sandpiper must be looked for on higher altitudes than are to be found in Kent and Sussex.

June 3rd, saw a number of Dunlin with black breasts; a somewhat late date. So far as my experience goes, none of the adults remain here during the entire summer. When feeding, the Dunlins seem convinced of the justice of the rule, "Share and share alike." Extended order is formed, or when in flock the rear portion alternately comes to the front, and in this way each bird partakes equally of what the tide lays bare.

On June 4th I made an expedition to the Hoppen "Petts" for the purpose of inspecting the colony of Black-headed Gulls. These "petts," which lie about four miles south-east of Lydd, consist of two large pieces of water of unknown depth. They are furthermore fringed with treacherous reed-beds which possess all the qualities of a dangerous bog. They are also the home of many leeches. When within a mile of these "petts" I could discern a number of Black-headed Gulls lining the banks, and looking like so many lumps of white chalk. On a nearer approach they all rose up, full of clamorous consternation—a veritable

sea-rookery—and circled above the water. They numbered about 200, and at least a quarter of these wore the dress of immaturity. I discovered over twenty nests, all containing eggs, with the exception of two which had young. These nests were invariably placed close to the edge of the reed-beds nearest the water. On one small "reedy" promontory there were no fewer than eight, situated hardly a yard apart. Of late years this colony of gulls has suffered much persecution, but the owner, Mr. Samson, of Lydd, exercises now a strict surveillance over it, with the result, I am glad to say, that the colony is rallying.

On June 12th a White Spoonbill appeared near the Midrips. Its appearance created considerable excitement amongst several of the fisherfolk. I have the following records of the occurrence of the Spoonbill in this locality. Two adult males were shot, May 9th, 1889, by two of the Southerden family. One of these specimens was subsequently sold to Mr. Gray, of Dover, for £7. In June, 1890, a party of five appeared: but, to use the words of the fishermen, "We were too greedy; we wanted the 'blooming' lot, and ended by getting none." On May 24th, 1891, an immature bird was obtained. There is another still in the possession of the Southerdens, shot some twenty years ago. This specimen is a very perfect one. The broad suffused rust-coloured ring at the base of the neck is remarkable for its intensity. The above records will show that these visits have become fewer and farther between of late years. The bird now in question was at the time of its being seen feeding along with five Herons. I have also observed this species on the sands in company with gulls.

The shore-line now (June 16th) is a perfect blank, save for a few immature gulls of sorts, who are regular attendants at such times when the tide lays bare the mackerel-nets, waiting in hopes of seizing some of the small fry which are left by the fishermen. Terns are also there to swell the company, and it is wonderful with what precision they dart into the nets and carry off their prey, while there are others, not so bold, who keep out at sea, hovering all the while over its surface, watching for the floating remnants of small fry which have been washed by the current through the net-meshes. After these they drop, falling into the water like so many ounces of lead.

On June 16th two Skylarks' nests were found in a meadow,

containing four and two eggs respectively, perfectly white—a variety which is identical with the texture of the Kingfisher's egg. The nest of four eggs was quite good, but the other had been deserted.

NOTES AND QUERIES.

MAMMALIA.

Otters and Badgers near Colchester.—I have within the last month purchased a young Otter and two half-grown Badgers, captured within five miles of this town. The Otter, rather under half-grown, was caught by a dog in a small brook at Alresford, Essex, and was offered me for sale May 23rd, the day it was captured. As it did not seem much injured I purchased it and sent it to the Zoological Gardens, fearing if I set it at liberty it might not be old enough to get its own living. The Otter was for many years very rare in Essex, but during the last few years would appear to be increasing in all our rivers, and is now found, as in the days when Daniell wrote his 'Rural Sports,' in the reed-beds of our marshes and in the sedges bordering our fleets, and I frequently at night hear its whistle in the river Colne, where it passes through this town. In this river it is becoming fairly common, and as it is admirably adapted for hunting with hounds, a visit from a pack would afford us a new sport, and I feel sure would give us great assistance in our endeavours to preserve the race. The Badgers were caught on May 4th at Stanway Hall, about four miles from Colchester, by the gamekeeper there, who had a few days previously captured and unfortunately destroyed their mother. These animals are not so rare in Essex as they were at one time, for it is not so long since several were caught near Braintree, and there are reasons for supposing that Badgers have continuously existed at Stanway and the neighbourhood. I purpose keeping these in their native county by setting them at liberty in Epping Forest, if it meets with the approval of the Verderers, to whom I have offered them. They would not have been disturbed at Stanway, had not the owner of the Hall, who is an enthusiastic foxhunter, been advised to get rid of them for fear of their injuring the foxes.—HENRY LAYER (Colchester).

Habits of the Stoat.—What is the number of young usually produced at a birth? In the case of its near relation, the Ferret, it is known to differ considerably; but domestication changes the nature and constitution of creatures, and alters their economy materially. The few books to which I have had access give the number of young as four or five, and occasionally six, and although this may be the usual average, yet I have known several instances where the number has been above six. I recollect, in one of my

entomological rambles in the dusk of evening, sitting down near a dense furze-brake. I had not been long seated before I heard a rustling close at hand, and turning round saw within a few yards of my feet an old Stoat and several young ones. It was very amusing to watch them at play; their active movements and sharp turnings, accompanied by a self-satisfied and happy sound between a purr and a chirp, was an experience not easily forgotten. On this occasion I am sure there were eight, if not nine, young in the litter. On another occasion a friend of mine was out with his gun and saw a Stoat with a young one in its month hastening to an old tree-stump in an hedge-bank. He shot it just before it reached its goal, and on going forward to pick it up was surprised to see several other young ones issuing from a hole in the bank near their dead parent. He stood at some little distance, and by uttering a chirping sound he drew forth six more young ones, all of which he killed. Last season a gamekeeper told me he had found a nest of young Stoats with a litter of ten; I thought perhaps in that case two litters might have been associating together. An accident that occurred at the end of May, however, set the matter at rest in my own mind. A gravid female Stoat having been found dead in a trap was sent to me, and curiosity led me to open the uterus, when I found that it contained no less than *eleven* well-formed young which would have shortly seen daylight. This may have been, and undoubtedly was, an unusual case of fecundity with the species, which both surprised and interested me; for, on the other hand, I have been informed on pretty reliable authority that sometimes a litter consists of but three young ones; so that it may be said to vary from two to twelve, which seems an extraordinary variation in a truly wild animal. On referring to 'The Royal Natural History,' now in course of publication, I observe that the late Prof. Bell is credited with the statement that the number of young is five; but that Dr. Coues states the number may vary from a pair to a dozen, although five or six may be taken as the average; still personal observations from readers of 'The Zoologist' would be interesting. In the work above named the statement as to the change of colour of the Stoat in winter is, I think, scarcely correct, as it is said to "always take place in the Highlands of Scotland; but proceeding further south the change becomes more and more rare, only occasionally taking place in counties like Cambridgeshire and Lincolnshire, while in Cornwall and Hampshire it is almost unknown." I cannot speak from experience of localities farther south or west, but in this part of Hampshire the change of colour takes place in a greater or less degree every winter, instances of which I have from time to time recorded in the pages of this Journal, and it is certain that an intensity of cold is not required to produce the change, for during the last extraordinary mild winter I saw two or three parti-coloured individuals, and one which was wholly white, except the head, and of course the characteristic black tip to its tail.—G. B. CORBIN (Ringwood).

Whiskered Bat in Carnarvonshire.—In the first week of June I found a male Whiskered Bat, *Vespertilio mystacinus*, in a short tunnel connected with some disused lead-mines near Abersoch. It was sleeping at a distance of some twenty feet from the mouth of the tunnel, where there was sufficient daylight to enable me to see it without lighting a candle.—CHARLES OLDHAM (Romiley, Cheshire).

Lesser Horseshoe Bat in Denbighshire.—On April 4th I was successful in finding several specimens of the Lesser Horseshoe Bat, *Rhinolophus hipposideros*, in the Cefn Caves, Denbighshire, and one in a cave at Tremeirchion, Flintshire. I send you one of the former alive, and hope you will receive it all right.—CHARLES OLDHAM (Romiley, Cheshire).

[Unfortunately, when the Bat arrived we had left London to spend Easter in Wiltshire, and on our return it was of course lifeless.—ED.]

BIRDS.

On the Specific Validity of Brünnich's Guillemot.—I do not propose to enter here into the vexed question of what constitutes a species. I simply record my experience and opinion. I have seen thousands and tens of thousands of both Common and Brünnich's Guillemots. The latter I have had abundant opportunities of studying closely, in North Greenland, Spitsbergen, and Novaya Zemlya, and in various parts of the Arctic Seas. I am well acquainted with the Common Guillemot from visiting many of its breeding-places in the British Isles and the Færoes. In the latter group I have handled hundreds of Common Guillemots that had been captured for food, and in the Arctic Regions I have examined hundreds of Brünnich's Guillemots, shot for a similar purpose. After long and intimate acquaintance with the two birds, I am left with the conviction that I never saw a Common Guillemot that I could for an instant confound with a Brünnich's Guillemot, nor an *Uria Bruennichi* that I could confound with *Uria troile*.—H. W. FEILDEN (Wells, Norfolk).

I was very much interested in Mr. Oxley Grabham's note on the "Specific Validity of Brünnich's Guillemot," for I also have been puzzled with birds occasionally thrown ashore in winter, not being able to satisfy myself of their identity. I have found specimens on the Enniscrone sands from time to time, and particularly one last winter, that in colour were quite as pure a black on the upper parts as a Razorbill, quite unlike the ordinary sooty brown colour of the Guillemot; but not seeing any apparent greater thickness in the bill, I could not look on it as a typical Brünnich's Guillemot. Like Mr. Grabham, I have picked up specimens with the feet varying in colour: so except for a marked thickness of bill, I cannot see how the bird, if a good species, can be identified.—ROBERT WARREN (Moyview, Ballina, Co. Mayo).

Remarks on *Anthus cervinus* in Sussex.—Owing to absence in the North of Ireland, I have only just read Mr. Ruskin Butterfield's note (p. 193). As he challenges my assertion that I could easily detect the specimen of *Anthus cervinus* amongst a flock of autumn-plumaged *Anthus pratensis* in the field, a few words in reply are necessary. Mr. Butterfield seems surprised that I did not make special mention of the fact that the specimen in my possession is the only one in autumn or winter plumage which has been met with in Great Britain; such a statement, however, would have been superfluous, for two previous examples only are on record, and in each case the period of the year when they were procured is well known. I have glanced again at my winter-plumaged *A. cervinus*, and compared it side by side with winter-plumaged *A. pratensis*, and cannot withdraw in any degree whatever from the assertion I made (*supra*, p. 101). The pale and very distinct cream-coloured stripes down the back, as well as on the crown, accompanied as they are by the bold blackish stripes; the generally pale coloration of the sides of the head, with the rufous tinge pervading, and the narrow stripes of black down the breast, are characteristics which at once distinguish the bird from the winter-plumaged *A. pratensis*. Wild birds arrange their feathers with a neatness and order which the most skilful taxidermist would find it difficult to imitate, and I do not hesitate to say that the most skilfully prepared skins, and probably the bulk of mounted specimens of either *A. cervinus* or *A. pratensis* have an untidy, disarranged appearance, which make them quite unlike the living originals. This observation has special reference to birds which have either dark or light tips to their feathers on the head, back, or breast. Taking the Pipits as an example, it will be found that in most cabinet specimens—and I am sorry to say in most illustrations too—the dark tips to the feathers are made to look like spots over the back or breast. But look at the living wild bird, and you will find that these dark tips to the feathers are arranged with such perfect order and regularity one over the other that they form clearly defined stripes and not spots. This is important when making a comparison between the winter-plumaged *A. cervinus* and *A. pratensis*, for, with its feathers neatly arranged in their proper order, the stripes of *A. cervinus* show far more distinctly and boldly than do those of *A. pratensis*. But if a skin or carelessly mounted specimen be used for comparison, the points of difference in most cases are obscured and identification becomes difficult. I have remounted the *A. cervinus* since I have had it in my possession, for I am very careful to show these distinctive stripes in all specimens in my collection. The remounting has so altered the appearance of the bird, and brought out its special features so prominently, that if Mr. Butterfield were to see it now, he would perhaps scarcely recognise it, but would see at a glance how materially it differs from an autumn-plumaged *A. pratensis* mounted in exactly the same style, and placed side by side

with it. I have laid stress on "winter-plumaged" *A. cervinus* and *A. pratensis*. Some importance attaches to this point, for *A. pratensis* in winter is a very different-looking bird to *A. pratensis* in spring or summer; the difference in the plumage of *A. cervinus* at these two seasons is well known to all. In this district *Anthus pratensis* occurs only as a winter visitor, and most of the specimens in my collection are in winter plumage. In April last I visited North Wales, and near Cader Idris I procured this bird in full breeding plumage. I was anxious to get one from this district, for I knew that I should not be likely to find clearer-plumaged birds elsewhere. Now comes the important point. Place this *spring*-plumaged *A. pratensis* by the side of the *winter*-plumaged *A. cervinus*, and the resemblance is so striking that I should be sorely puzzled to distinguish between the two birds at a very little distance indeed. In fact, I might not be able to do so unless I had the birds in my hands. And here I venture to think that Mr. Butterfield, and perhaps the authorities quoted by him, may have been led into some confusion with regard to these birds by comparing undated specimens of *A. pratensis* which may have been in spring plumage, with winter specimens of *A. cervinus*: this would not be a fair comparison. It must be obvious that when I stated that I could readily distinguish the difference between *A. pratensis* and *A. cervinus* in the field, I was referring to both birds in winter plumage, for who would ever expect to see together in the field *A. cervinus* in winter and *A. pratensis* in spring dress? The quotation from Mr. Dresser's letter that "the dark tips to the feathers in all stages of *A. cervinus* are broader than in *A. pratensis*" surprises me much, for in all specimens of *A. pratensis* I have the dark tips are broader than in this *A. cervinus*. It will be noted that I have stated above that one of the characteristics of my *A. cervinus* is the narrow stripes down the breast. Unfortunately I do not possess a series of skins of *A. cervinus* for comparison; indeed, this is the only specimen of the bird I have ever seen. It would perhaps have been better to quote more of Mr. Dresser's letter. I may here state that an important point of distinction between the two birds, apart from plumage, is that the bill of *A. cervinus* is much smaller and finer than in *A. pratensis*, and in cabinet specimens the legs of the latter dry much darker in colour than the former. In conclusion, then, so far as my observations go, *A. cervinus* and *A. pratensis*, both in winter plumage, may be readily distinguished one from the other, even in the field; but *A. cervinus* in winter so closely resembles *A. pratensis* in spring that it is extremely difficult to distinguish them, so far as plumage is concerned.

—F. COBURN (Holloway Head, Birmingham).

Nesting of the Hawfinch in Lincolnshire.—I think it possible that readers of 'The Zoologist' may be interested to know that a nest of the Hawfinch, *Coccothraustes vulgaris*, has been found in the park at Lea Hall, near Gainsborough. It is placed rather more than half-way up a large old

hawthorn (see Yarrell, 4th ed. vol. ii. p. 100), and made of small black twigs with a sort of cup in the middle. Our butler discovered the nest accidentally by finding two young nestlings below the tree on the ground. He put them in a small wire-cage, and tied it half-way up against the trunk. He has since seen the old birds come and feed the caged young ones. The latter are almost fully fledged, and have the black and white wing-feathers very strongly marked. Their large beaks are still (June 13th) quite soft. They sit solemnly side by side on the perch in the cage, and look very funny with small tufts of down sprouting from among the head feathers. They allow visitors to approach quite closely without moving, or appearing in the least alarmed. I see Yarrell (*l. c.*) states that the Hawfinch has increased and spread enormously of late years, and that the discovery of its nest in Lincolnshire "is probably only a matter of time." It has been sought for here for many years, but never until now with success. There are every summer several pairs of Hawfinches about the garden, feeding on the peas. In the autumns of 1879 and 1880 I often saw these birds feeding on the yew berries and pecking about on the gravel beneath the yew tree in a garden on the banks of the Trent.—MRS. ANDERSON (Lea Hall, Gainsborough, Lincolnshire).

Song of the Icterine Warbler.—Like Mr. Benson, I think the song of *Hypolais icterina* is one of the finest we can hear, and I cannot understand the late Mr. Seebohm affirming that it is "immeasurably inferior" to that of the Nightingale. The song certainly "does not fill the ear" like that of the last-mentioned bird, and Mr. Seebohm here expresses precisely the feeling I have experienced while listening, though I have not had the good fortune to hear both species singing at the same time. Personally I do not think the two songs can rightly be compared; each is original, and possesses perhaps more points of difference than of resemblance to the other. Mr. Aplin is doubtless correct in surmising that birds "vary in the quality and manner of delivery of their songs in different localities." The author of 'A Year with the Birds' (3rd ed. p. 258) has stated that he found in 1886 the Yellowhammers in South Dorset "singing in a different manner from" those in Oxfordshire, "though it would be almost impossible to describe the difference;" and the same author also mentions that he has noticed the same in the Chaffinch, but in this case the localities were more widely separated.—W. RUSKIN BUTTERFIELD (10, Stanhope Place, St. Leonards-on-Sea).

Rooks Nesting in Laurels and Holly.—Being desirous of procuring a few varieties of the eggs of the Rook, Mr. Thomas Parkin and I on April 11th drove over to Beaufort, the seat of Sir Archibald Lamb, Bart., through whose kindness our desire was not only gratified, but we were enabled to learn many interesting particulars of the fine old Rookery in the

park there. The nests are for the most part placed in oaks and firs, but there are several (one of which we found to be about nine feet from the ground) built in laurels, and one in a holly. There is no obvious reason for the choice of these low sites, the park being studded with hundreds of acres of tall and suitable trees. The owners of these nests do not appear to be harassed by their more elevated neighbours, and the nests are in good condition. One of the eggs we secured was from a nest of three, all of which were no larger than eggs of the Mistletoe Thrush. — W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Increase of the Turtle Dove in Lincolnshire.—It may be of interest to record the fact that this summer and last, the increase of Turtle Doves in the garden and grounds here has been quite extraordinary. In Yarrell's 'British Birds' (ed. 1841) there is a note by my father-in-law, the late Sir C. Anderson, as follows:—"A pair of Turtle Doves bred here in 1870." This is recorded as a rarity. In the fourth edition of this work (vol. iii. p. 22) it is remarked that, "Owing to the great increase of conditions suitable to their habits, these birds are both more numerous and more widely distributed than in former years." This, however, would hardly account for the fact that they seem to have driven away the Wood Pigeons. In former years the loud, clear note of the Ring Dove sounded incessantly all day long in this garden. It is now seldom heard; while the low "purr" of the Turtle takes its place. In May it was incessant, and sounded from morning to night all over the garden. The birds themselves are so shy I have never seen them; but their deep, rich "karoo" begins at dawn, and I often hear it at 4 a.m. from my bed-room. Last year an interesting experiment was tried with the eggs of the Turtle Dove. Our butler found a nest in an elder-bush in a small plantation near the house. He cleverly made an exchange between the eggs of a tame Indian dove—then sitting in a cage against the house—and those of the Turtle. Both birds continued to sit on their substituted eggs; but the Turtle, from some unknown cause, deserted at the end of a week. The tame dove persevered in her duties and hatched out two young Turtles. One died, but the other was reared and kept for some time in a cage. It was, however, so wild, and beat itself about the cage in such a painful manner whenever a human being approached, that it was set free and flew away, returning once or twice to feed with the tame doves on the lawn, but eventually departing for good.—Mrs. ANDERSON (Lea Hall, Gainsborough, Lincolnshire).

Incubated Cuckoo's Egg on the Ground.—I was lately shown an egg which in my opinion the finder rightly regards as a Cuckoo's. The egg was found on June 4th, 1894, on a slight declivity near the rectory garden, without any trace of a nest. On being blown it proved to be incubated, I should say for about five or six days. It might have been

placed where found by some birds-nesting boy, or it may have been carried there by some bird, though this seems unlikely, for egg-stealers among birds usually, I believe, carry away their spoil impaled on their bill. Perhaps, after all, there is more in the habits of *Cuculus canorus* than is dreamt of!—W. RUSKIN BUTTERFIELD (St. Leonards-on-Sea).

Cuckoo's Egg in Rock Pipit's Nest.—On June 4th I took two eggs of the Rock Pipit and one of the Cuckoo from a nest on the cliffs at Abersoch, Carnarvonshire, and as Mr. E. Bidwell informs me that the Rock Pipit is a rather rare fosterer of the Cuckoo, the present instance is therefore perhaps worth recording. — CHARLES OLDHAM (Romiley, Cheshire).

Disease in Wood Pigeons.—During last autumn and winter the unusual abundance of Wood Pigeons in the western portion of the New Forest and neighbourhood was a cause of frequent remark, and many of the birds were killed, a majority of which presented the peculiarity of having lost their flight-feathers in a greater or less degree, and of being attacked more or less with a tuberculous disease which appeared particularly about the beak, legs and feet, causing unsightly swelling, with a discharge which in some cases smelt disagreeably. Whether this disease was contagious or not, I am not prepared to say; but, viewing it in the light of the often-discussed "germ theory," it seems possible, if not probable. At the time that the Wood Pigeons were suffering in this way I saw a female Merlin almost in the same plight, with swollen feet and nostrils, possibly from feeding upon the diseased birds, if indeed this little falcon, like the more powerful Peregrine, takes so large a quarry. Amongst the pigeons I saw one which was suffering badly from the before-mentioned disease, and not in good plumage, had the head pale grey, neck, back, and wing-coverts uniform vinous or purple-grey—reminding one of the Turtle Dove's breast, only darker—shading off almost to rust-colour on greater wing-coverts; breast paler vinous, and the twelve feathers of the tail were mottled dark grey and white, the latter colour predominating. The larger quill-feathers of the wings were of the usual leaden hue, with white edges; there was no indication of the "ring" upon the neck, and the eyes were of a much deeper yellow than in the ordinary type. Sex, female.—G. B. CORBIN (Ringwood, Hants).

Nightingales on the Welsh Border.—On May 13th we heard the Nightingale here, for the first time since 1889, in agreement with the local tradition that they come once in seven years. I believe there are only two pairs. We are seven miles from the Welsh border.—(Miss) MARGARET G. ROBINSON (Peterchurch, Hereford).

[The accuracy of this information is vouched for by the Rev. J. E. Kelsall, who is known to many of the readers of this Journal as a good ornithologist.—ED.]

Hérons and Watercresses.—In the April number of the 'Agricultural Students' Gazette,' Miss Ormerod—so well known for her investigations of the habits of injurious insects—contributes an interesting note showing the prejudicial effect on watercress-beds which may be caused by the thoughtless destruction of Herons. This observation reminds us of Darwin's remarks concerning cats and clover, through the intervention first of mice and then of bees ('Origin of Species,' chap. iii.) and is worth quoting. Miss Ormerod writes:—"We all know that Herons eat fish; in the present instance trout are the kind especially under consideration; also that trout eat water insects of various kinds (in this instance the well-known 'Caddis worms') which often feed partly or wholly on vegetable matter. But to have these facts in sequence—in successive series—on one area of less than an acre in extent, culminating in such destruction of the vegetable food (in this instance watercresses) that on special investigation three-quarters of the crop was found to be materially damaged, if not totally destroyed for sale purposes, is what may be considered an only too complete observation. It was on January 23rd that I received a bottle containing specimens of injured watercresses, together with a plentiful supply of what are so very well known as 'Caddis-worms,' that it is unnecessary to describe them. Several of these trichopterous larvæ were free from their cases, and thus their somewhat cylindrical shape, horny head, leathery three following segments, with a pair of legs attached to each, and white soft succeeding segments were clearly noticeable. So also were the two strong curved hooks, placed far apart, one on each side of the caudal extremity, of which it is said the larvæ make use to fix themselves where they may desire to be stationary. These strong little hooks were a very striking point in their economy, for on lightly drawing the larva along my finger, their catching power was distinctly perceptible; or on drawing them along the woollen tablecloth they raised threads of the wool. In due time the larvæ go through their changes up to the state of the four-winged flies, known as 'Caddis flies,' or 'water-moths.' These when at rest have the wings deflexed, and as a regular thing both pairs are furnished with branching nerves. The front pair are usually somewhat hairy, the hinder pair sometimes, if not always, folded when at rest. Most of the kinds appear during the summer, and of the vast number of species Stephens says (Illustr. Brit. Ent., Mandibulata, vol. vi. p. 146) in general habit they greatly resemble each other, and from the almost total uniformity of colouring that obtains amongst them, they are extremely difficult to divide specifically from each other. In regard to prevention of attack of these water-grubs, which was the object with which the collection of specimens and report of investigations was sent me, I felt very much at a loss, never having had experience in the treatment of watercress beds on the scale of management for sale. It was obvious, however, that poisonous applications, either to the leafage, or thrown into

the water, were inadmissible, and the only practical measure appeared to be introducing some live agency (possibly the common carnivorous water-beetles) which might clear the obnoxious plant-eating larvæ. To this suggestion I received the reply that 'there were lots of trouts till the Herons came;'—but for reasons (which might give offence if specified here) there were difficulties in the way of having the Herons got rid of. Here we come to what appears to me of a good deal of interest. Besides what is known to, or is before us all, as to partiality of trout for insect food, on turning to Walton's 'Complete Angler' (7th ed. pp. 302–308), I found a mass of observations on the 'divers kinds of Caddis, or Case-worms . . . which be a choice bait for any fish,' and at page 305 he mentions some that 'be usually bred in the very little rills or ditches,' of which (piscatorially speaking) he writes 'doubtless they are the death of many trouts.' This is followed by directions of how the Caddis-worm is to be *ordered*, and then thrown 'into any great still hole where a trout is, and he will presently venture his life for it, it is not to be doubted, if you be not espied,' &c., &c. Other causes of destruction may just possibly have been present, but the subject having been repeatedly investigated in the course of report to myself, I see no reason at all to doubt that it was the great amount of presence of the Caddis-worms that caused mischief, and Isaac Walton's evidence of the love of trout for Caddis-worms as baits points strongly to their knowledge of the goodness of the larvæ for food in more natural circumstances; and that in their removal the watercress grower lost very helpful friends. The habits of Herons need no comment, and the sequence of events consequent on local encouragement (beyond what in these days is called 'natural balance') of one large species of birds of special habits, downwards through destruction of insect-eating fishes, and overplus of vegetable-eating insects, to the great pecuniary loss of the grower of the insect-injured crop, is, I think, of some interest.—E. A. ORMEROD."

Bird-life in the Dutch Water Meadows.—A writer in 'The Spectator' of May 23rd last, who though anonymous is evidently an observant naturalist, gives a pleasing description of the appearance presented in summer by the reclaimed marshes or "polders" of Holland, which afford such excellent pasturage for cattle; and from personal observation we can vouch for the accuracy of his description. He says:—"Whitethroats, Linnets, Finches, Blackcaps, Thrushes, Flycatchers, Robins, and other hedge and thicket-living birds are absent in a region where dykes take the place of fences, and there is no hedgerow timber. Only in the dense copses of alder, rooted in stagnant water and matted with a jungle of marsh-plants, do the river-side warblers appear. There the Sedge-bird, the Reed Warbler, and the Great Sedge Warbler, the finest of all Continental song-birds, except the Nightingale, may be heard at all hours of the day. But in the open 'polders' between the long rhines of water which run parallel, like lines of

ribbon, between the strips of sound ground, even the Lark and Pipit are scarcely seen. Their place is taken by birds which in England are only found in the salt-marshes or on the high moors. Hundreds of Redshanks nest in the mowing grass, and every few acres hold a pair of these noisy but most ornamental birds. They are incessantly in motion, skimming low over the grass and water, with bright red legs stretched backwards, and uttering their musical call. Godwits, a large wader, are almost equally common, and their fine olive-clouded eggs, as well as those of the Redshank, are brought in numbers into the towns for sale as 'Plover's eggs.' Another 'polder' bird is the Oystercatcher. These not only nest in the meadows,* but fly in at all times of the year when the flood-tide has driven them from the sands of the shallow sea beyond the dunes. Of all the birds of the district the Oystercatchers are the most restless and vociferous, dashing at any trespassers, whether dog or man, and pursuing them with incessant screams until they have left the neighbourhood of their nest, when the pursuit is generally taken up by a second pair. The Curlews nest on the margin of the sand-dunes, but haunt the wet meadows at all hours of the day and night. Even Swallows and Martins are not common, their place being taken near the coast by the beautiful white Terns, the 'sea-swallows,' which twist and hover over the canals and dykes on the watch for fish. These Terns are as tame as English Sparrows; tamer perhaps, for while the Sparrow has the boldness which comes from familiarity with danger, the Terns pursue their fishing by the roadside as if man did not exist. Each bird beats a certain length of canal, drifting on long white wings almost as the wind carries it, and falling instantaneously to the surface when it sees a fish. When tired the birds fly to the locks, and there sit sunning themselves on the black-and-white mooring-posts which stud the water near the bank. Wild Ducks are scattered over the whole of the 'polders,' though nowhere in great numbers, except round the large country-houses where they are preserved. But every alder copse seems to hold a brood, and the old Mallards lie out all day in the sun in the thick grasses among the butter-burrs. Herons frequent every part of the polder flats, and the number of heronries in the thick canal-bordered woods which surround the mansions of the Dutch country squires is very large. That at the Royal Palace, which was the scene of the last meets at the Loo Hawking Club, is the largest and best known. But in many of the least wooded districts they seem equally common, though suitable sites for nesting-places do not exist. Like the Cormorants in the Amsterdam Zoological Gardens, which have built nests upon the ground adjoining the lakes, these Herons have abandoned their usual habits, and nest wherever a few trees offer a home. One considerable colony, between the Hook of Holland and Schiedam, is

* This information will be new to those who are accustomed to regard the Oystercatcher as almost exclusively a shore bird.

built in the small elms surrounding a farmhouse and buildings, and the Herons, with a number of Rooks, bring up their young above the sights and sounds of a cow-stable and poultry-yard. Storks, formerly so common, seem to be gradually deserting Holland. A pair have built in the topmost pinnacle of the spire of the new Reichs Museum at Amsterdam, and a tree which was inhabited eighteen years ago near the house of Oesterbeg, at the Hague, still holds a nest. But the spectacle of a brood of young Storks, wading about in the wet grass and catching frogs in the evening, is no longer one of the common sights of Holland. Towards the southern shore of the Zuyder Zee the level of the polders sinks, and there, at more than one point, even the Dutch engineers are unable to free the flat from stagnant waters. But the transition from dry polder to wet polder, and thence to marsh, is shown only by change of vegetation and the disappearance of sheep from the meadows. The bird-life remains the same."

MOLLUSCA.

Carnivorous Habits of *Limax agrestis*.—In a foot-note to Mr. F. V. Theobald's paper, "Mollusca injurious to Farmers and Gardeners" (Zool. 1895, p. 208), the statement that *Limax agrestis* eats earthworms is questioned, and it is suggested that the slug had been mistaken for *Testacella*. Mr. Theobald's authority for the statement was, presumably, the late Dr. Gwyn Jefferys, who quotes Mr. J. F. Whiteaves, but does not say whether the earthworms eaten were alive or dead ('British Conchology,' vol. i. p. 134). I have occasionally seen *Limax agrestis* feeding upon dead earthworms in my garden, and in the fields here. Mr. W. A. Gain ('Journal of Conchology,' vol. vi. p. 361) found that in confinement it would not touch earthworms, although mutton, raw and cooked, was eaten. The dead bodies of other slugs are sometimes devoured. A few days ago I watched an individual of *Limax agrestis* feeding upon the crushed body of an *Arion subfuscus*. Mr. H. W. Kew has seen it eating a dead *Limax flavus* ('Naturalist,' 1889, p. 107), and the Rev. A. H. Cooke states that it has been known to feed upon the crushed remains of *Arion ater* ('Cambridge Natural History—Molluscs,' p. 31). Perhaps the most remarkable instance of its carnivorous habits is that recorded by Mr. Cooke (*loc. cit.*), in which five examples were observed, each feeding upon a May-fly.—CHARLES OLDHAM (Romiley, Cheshire).

ANNELIDS.

Large example of *Trocheta subviridis* in the Thames.—Early in the spring of this year Mr. Latimer Clark, F.R.S., brought to the Natural History Museum a large Leech which had been found in a canal opening into the Thames, near Maidenhead. He wrote me that "the men who found it said they knew Lampreys and Leeches well; they were confident it

was not a Leech or Lamprey, and were quite afraid to touch it; they said they never saw one like it before, so I am afraid there will be a difficulty in getting more of them, but will try." Later on Mr. Clark sent me a note from one of his servants, from which I gather that other similar specimens had been seen, though unfortunately not secured. As the Editor of this Journal directed attention to Dutrochet's "Land Leech" in 1887 (see Zool. 1887, p. 515), and as this large Leech is said by Dr. R. Blanchard, who is the best living authority on the group, to be "*une gigantesque Trocheta subviridis*," I think it as well to put on record the appearance of this huge form. During my absence in the spring Mr. Pocock had it under observation in water for something like two months, and he often observed it extend itself to about the length of a foot, or about twice the known maximum length. Preserved in spirit it measures about 230 mm. or something like 9 inches. Its great size appears to be the only point worthy of special remark.—F. JEFFREY BELL (British Museum, Nat. Hist.).

SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

June 16th.—Sir W. H. FLOWER, K.C.B., F.R.S., President, in the chair.

Mr. Sclater exhibited and made remarks on a coloured drawing of the Gnu of Nyassaland, taken by Mr. Caldwell from the specimen transmitted to the British Museum by Sir H. H. Johnston, K.C.B., and exhibited by Mr. Sclater at a former meeting. The specimen seemed to be referable to a new local form of the Brindled Gnu, which Mr. Sclater proposed to name *Connochates taurinus johnstoni*.

Mr. Holding exhibited and made remarks on various abnormal horns and antlers of the Caucasian Wild Goat and two species of Deer.

Mr. E. E. Austen gave an account of a journey undertaken by Mr. F. O. Pickard-Cambridge and himself up the Lower Amazons, on board Messrs. Siemens Bros. Cable s.s. 'Faraday,' for the purpose of making zoological collections on behalf of the British Museum. No terrestrial mammals were met with, but observations were made on the two species of freshwater Dolphins, *Inia geoffroyensis* and *Sotalia tucuxi*, or *S. fluviatilis*, which are extremely abundant in the Lower Amazons. Among the birds the only species of special interest collected were a little Goatsucker from Manaos, referred provisionally to *Nyctiprogne leucopygia*, and a Woodpecker, *Celens ochraceus*, of which the British Museum previously possessed but two specimens. The Reptiles and Amphibians met with all belonged to well-known and widely-distributed forms, and the chief interest of the collections centred in the Invertebrates. Among these Mr. Pickard-Cambridge made

a large collection of Spiders, including an extensive series of the large hairy *Theraphosida*, eleven species of which were pronounced to be new. An interesting collection of the nests of some of these forms was also obtained. Mr. Cambridge likewise secured several specimens of *Peripatus*. Mr. Austen, who devoted himself chiefly to Insects, obtained some 2500 specimens of different orders, of which it was expected that a fair proportion would prove to be new. Attention was drawn to some interesting examples of mimicry.

Mr. P. Chalmers Mitchell read a "Contribution to the Anatomy of the Hoatzin (*Opisthocomus cristatus*)."

He stated that from the characters of the alimentary canal, the Hoatzin might be placed either between the Sand-Grouse and the Pigeons, or between the *Gallinae* and the *Cuculidæ*. He described some interesting individual variations in the condition of the ambiens muscle, and referred to other points in the muscular anatomy.

Mr. G. A. Boulenger gave an account of the occurrence of *Tomistoma schlegeli* in the Malay Peninsula, and added some remarks on the atlas and axis of the Crocodilians.

A communication was read from Mr. W. Schaus containing notes on Walker's American types of Lepidoptera in the University Museum, Oxford.

Mr. Hamilton H. Druce read a paper entitled "Further Contributions to our Knowledge of the Bornean *Lycanidæ*," in which he referred to about forty species of this family not hitherto recorded from Borneo. A number of these were new, and were now described by Mr. G. T. Bethune Baker and the author.

Mr. F. G. Parsons read a paper on the anatomy of *Petrogale xanthopus* as compared with that of other Kangaroos.

Dr. J. Anderson communicated, on behalf of Miss M. E. Durham, some notes on the mode of swallowing eggs adopted by a South African Snake, *Dasypeltis scabra*, as observed in the specimens now living in the Society's Gardens, and illustrated by a series of drawings.

Mr. F. O. Pickard-Cambridge read a paper on the Spiders of the Family *Aviculariida*, taken during the expedition up the Amazons previously described by Mr. Austen.

Mr. G. A. Boulenger read the description of a Gecko which he proposed to refer to a new genus and species as *Mimetozeugon floweri*, in honour of Mr. Stanley Flower, who had obtained the specimen at Penang.

This meeting closed the session.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 3rd.—Dr. D. SHARP, F.R.S., Vice-President, in the chair.

Mr. Gervase F. Mathew exhibited the new species of *Leucania*, *L. flavicolor*, recently described by Mr. Barrett (Ent. Mo. Mag. 2nd ser. vol. vii. p. 99), and also the varieties of *L. pallens* noticed by Mr. Barrett in the same

article (*l. c.* p. 100). He also exhibited a remarkable variety of *Mamestra abjecta*, which bore a close resemblance to *Apamea gemina* var. *remissa* and to *Hadena genistæ*, and a bred specimen of *Eupithecia castigata* (?), with nearly the whole surface of the wings (the margins excepted) denuded of scales.

Mr. Elwes exhibited a collection of butterflies taken in the neighbourhood of Gibraltar during last April, and said that he had found the district very unproductive, owing to the great drought. Mr. J. J. Walker remarked that Mr. Elwes had been unfortunate, as during three spring seasons his experience had been very different; at the same time it seemed to be agreed that Spain, as a whole, was not so rich in Lepidoptera as in other orders of insects.

Dr. Sharp exhibited, on behalf of Mr. Hampson, specimens of the female of *Oiketicus crameri*, recently sent by Mr. Dudgeon from Sikkim. The females in this species are so maggot-like that it is difficult to recognise them as perfect moths. There were also two pupa-shells, one of which was used as a receptacle for eggs, and in the other eggs had hatched, so that it had the appearance of a pupa filled with young larvæ.

Mr. R. W. Lloyd exhibited a specimen of *Athous hamorrhoidalis*, from Savernake Forest, Wilts, with a curious malformation of the right antenna.

Mr. Waterhouse exhibited several branches of oaks from the New Forest, entirely denuded of foliage, and stated that throughout large tracts of the forest the oaks had been stripped of their leaves in the same fashion by lepidopterous larvæ, especially *Cheimatobia brumata*, *Hybernia defoliaria*, and *Tortrix viridana*. Certain trees, however, though situated among the denuded trees, had quite escaped. Dr. Sharp suggested that they belonged to a different species; but Mr. Waterhouse said that he had carefully examined them, and that this was not the case. Mr. McLachlan said that the immunity of the trees referred to was probably due to irregularity in coming into leaf. The discussion was continued by Messrs. Elwes, Champion, Blandford, Jacoby, and others.

Mr. Tutt exhibited living pupæ of *Enodia hyperanthus* and *Epinephele ianira*, and pointed out how different the pupæ of these two species were in general appearance, structure, and cremastral attachment. He pointed out that these two species had for a long time been erroneously placed in the same genus, but that, in all stages, they were widely separated, and that not only should they be placed in different genera, but that they appeared to belong to different tribes—*Enodia hyperanthus* being in the Cœnonymphidi and *Epinephele ianira* in the Epinephelidi (*vide* Entom. Record, vii. p. 301). He also exhibited living pupæ of *Thecla pruni* which had been sent to him by Mr. H. Moulsey. He called attention to the great resemblance that the pupa bore, in its dorsal aspect, to a bird-dropping. Black in ground colour, the two whitish prothoracic patches, and

the similarly coloured metathoracic patch which extends transversely across the constricted waist, give it a resemblance that cannot be misunderstood.

Mr. Blandford exhibited live specimens of *Callidium variabile*, L., bred from the bark of beech timber from Blenheim Park.

Mr. A. J. Chitty exhibited two specimens of *Osphya bipunctata*, F., taken by himself and Mr. J. J. Walker at Chattenden Roughs, and two species of *Psylliodes cyanoptera*, Ill., from Wicken.

Canon Fowler exhibited specimens of *Xyletina ater*, Panz., taken by Dr. Chapman in Herefordshire; this was the first time this beetle had been recorded from this or the neighbouring counties.

Mr. Blandford exhibited and described series of Tropical American butterflies from the Godman-Salvin collection, arranged to show the existence and geographical distribution of homœochromatic groups. Mr. Elwes characterised the exhibition as the most interesting that had been before the Society for many years, and hoped that the series would not be broken up, as was intended, until an opportunity had been found for full discussion of the various questions raised. The latter point was also urged by Dr. Sharp and Col. Swinhoe, and at the conclusion of the meeting Mr. Blandford announced that Mr. Salvin had kindly consented that the series should be kept intact in order that it might form the subject of a special discussion later in the year, and that he himself would defer the publication of his remarks in view of the anticipated re-opening of the matter.

Dr. Chapman communicated a paper "On the Phylogeny and Evolution of the Lepidoptera from a pupal and oval standpoint."—W. W. FOWLER, *Hon. Secretary.*

NOTICES OF NEW BOOKS.

The Hare. Natural History, by the Rev. H. A. MACPHERSON; Shooting, by the Hon. GERALD LASCELLES; Coursing, by CHARLES RICHARDSON; Hunting, by G. H. LONGMAN and J. S. GIBBONS; Cookery, by Col. KENNEY HERBERT. 8vo, pp. 263. With Illustrations. London: Longmans, Green & Co. 1896.

THIS is the fourth volume which has been issued of Messrs. Longmans' "Fur and Feather" series, and a very good volume it is. In the previous contributions to the series only game-birds have been dealt with, namely, Partridge (Zool. 1894, p. 199), Grouse (*tom. cit.*, p. 358), and Pheasant (Zool. 1895, p. 397). In the present case, we have to reckon with an animal which may not only be shot like its predecessors, but may be hunted with

harriers or beagles, and coursed with greyhounds. Hence the necessity for finding an extra number of contributors to the volume; and this should have suggested to the editor a modification of the first sentence on the second page of his Preface, as well as the substitution of the word "species" for "variety" in the second sentence on that page.

The first section of this volume on the natural history of the Hare seems to us too sketchy, and not full enough of information. Several points of interest are not touched upon at all. For example, we find nothing said about the period of gestation, or about superfoetation, on which Sir Thos. Browne has discoursed so quaintly; about the condition of the young at birth as compared with young Rabbits; about Hares burrowing and going to ground; about their carrying the young; about the call of the doe Hare to the young; about their fondness for hawthorn berries (Zool. 1867, p. 604), though holly berries are mentioned (p. 27); about the change of colour in winter of the Irish Hare; and about the comparative weights of English and Scotch Hares. Mr. Macpherson remarks (p. 6) that he has "not been able to obtain the weights of Russian Hares." Some statistics on this point will be found in 'The Field' of Nov. 18th, 1893. On the subject of varieties, melanism, and albinism, more might have been said. Mr. Macpherson states (p. 48) that "a list of the black Hares that have been killed in Great Britain would be a very short one." He will find several mentioned in an article on "English and Scotch Hares" in 'The Field' of August 29th, 1891, since which date others have been reported. For example, a black Hare was shot near Newmarket on the 12th September, 1893 ('The Field,' Sept. 23rd, 1893), and another was killed at Haverhill, Suffolk, in January last ('The Field,' Feb. 1st, 1896).

The chapter entitled "The Hare and the Lawyers" is a very meagre one, and affords no adequate view of the present state of the law affecting Hares, a subject of much importance, which should have been more fully dealt with.

Mr. Lascelles in the succeeding section on Shooting has some remarks on the Ground Game Act of 1880, with which we entirely agree. He says:—

"Leaving out all questions of sport, it is difficult to see what good has resulted to anyone from this unfortunate piece of legislation. Never once have we heard a good word spoken for it, either by

labourer, tenant, or landlord. The shooting tenant, to whom the landlord looks for the means to pay the charges on his estate, is the principal sufferer, because farmers do not care to forego any right they may possess—however useless or unsought it may have been—in order to assist a stranger. On some few estates the Act has been a dead letter, because the farmers' relations with their landlord were such that they did not desire to vex him or curtail his enjoyment of his own property for the sake of any advantage forced upon them without their request by the Government of the day."

Another passage in this chapter deserves quotation, on the barbarous practice of shooting at Hares at long ranges. Mr. Lascelles writes:—

"Here let me put in a word, addressed chiefly to the youthful sportsman, never to fire a long shot at a Hare going straight away from him. It is but useless cruelty. I will suppose in these days of weapons of precision, and careful education, that all our young friends have learned to hold pretty straight. They do not, therefore, miss the unfortunate Hare, as little bits of fleck floating in the air demonstrate; but what becomes of her? Occasionally she is picked up by the beaters, dead in a hedgerow three fields away, but more often she is killed—an emaciated wreck—by some shepherd's dog or cur three weeks afterwards. The error and the cruelty are not chargeable to the powers of the gun, nor to the aim of the owner, but to his bad and hasty judgment in firing shots, some of which no doubt will occasionally kill but which in nine cases out of ten he ought to leave alone."

Mr. Lascelles lays it down that thirty yards is the outside range at which Hares should be shot when running straight away from the sportsman, though when crossing the gun they may easily be killed ten yards further off. He gives some useful hints on aiming, and on the necessity of keeping the gun moving in the direction in which the Hare is running.

The sport of hunting the Hare with a pack of hounds is one of the oldest, and in early times was very different to what it is now. Mr. J. S. Gibbons points out some of the changes which have taken place in the method pursued, as well as in the breed of hounds, and after discussing the best size for a harrier—the limit of height being placed between 18 in. and 21 in.—and the easiest way of securing a level pack of hounds (p. 203), mentions "a few points which may be borne in mind by a young hunts-

man" (p. 217). These strike us as being sound and practical. There may be nothing very new in them; it would be difficult indeed to write much that is new on the subject of Hare-hunting, but what the writer has to say is well put, and appears to be the outcome of his own experience. The same may be said of the sections on "Coursing," by Mr. Charles Richardson, and on "Beagling," by Mr. G. H. Longman. To the readers of a natural history journal, however, these portions of the volume will appeal less strongly than the pages for which Mr. Macpherson is responsible. An improvement throughout the volume would be effected by the substitution of headlines that indicate the contents of each page, for in the absence of an index it is very troublesome to discover, without reading several pages, whether any information is given on a particular point or not.

The illustrations, by Messrs. Giles, Thorburn, and Charles Whymper, are for the most part excellent, and have been well reproduced from the originals by the Swan Electric Engraving Company.

The Birds of Berwickshire: with Remarks on their Local Distribution, Migration, and Habits, and also on the Folk-lore, Proverbs, Popular Rhymes, and Sayings connected with them. By GEORGE MUIRHEAD, F.R.S.E., F.Z.S. In two volumes. Vol. II. 8vo, pp. 390. With numerous Illustrations. Edinburgh: David Douglas.

WHEN noticing the first volume of this excellent work (Zool. 1890, p. 114) we expressed the hope that it might be speedily completed, and though at that time we were not prepared to anticipate a delay of five or six years, we are now pleased to congratulate the author on the accomplishment of his task.

In our former notice we dwelt upon the fact that Mr. Muirhead does not confine his attention merely to an enumeration of the various birds to be met with in Berwickshire, but discourses on folk-lore, proverbs, and popular rhymes, which treatment of the subject has so swelled the proportions of his work as to necessitate the publication of a second volume.

It is scarcely possible, in the space at our disposal, to give an adequate idea of the variety of interesting matter which this second volume contains. It begins with the Accipitres, and

includes at the outset a sketch from ancient records of falconry as formerly practised in Berwickshire and the adjacent country. Then come the Steganopodes, amongst which the account given of the Gannet is notable by reason chiefly of the excerpts which are given from the books of John, Duke of Lauderdale, respecting the price of Solan Geese, or, as they are therein termed, "Sollen-geese," between the years 1674 and 1678.

At page 43 we find a list of the heronries (fourteen in number) which were found to exist in Berwickshire in 1887, the statistics showing the number of nests in each colony, and the kind of trees selected.

The account given of Billie Mire, an extensive and almost impassable morass, the haunt of innumerable wildfowl, is especially interesting from the fact of its being the principal resort of the Bittern in Berwickshire, as well as of several other birds, such as the Hen Harrier, which are now rarely or never seen in the county.

There can be little doubt that in ancient times, long before the days of agricultural improvement and drainage, whilst as yet the Merse was covered with bogs and morasses which are now drained, the Bittern was to be found in every part of this county; and it may be well supposed that King James IV., who frequently resorted to Bathgate Bog to fly his falcons at the Bittern there, would not fail to try their mettle at this ancient quarry in some of the Berwickshire marshes when he visited Lauder in 1489, and Hume Castle in 1496, with his falconers.

Immense flocks of Wild Geese frequent Berwickshire during the autumn and early spring, and these, according to Mr. Muirhead, consist of the Bean Goose and the Pink-footed species, the average date of their arrival being the 26th of October, when they are generally observed flying from the north-west to the south-east. In a tabular form, extending over fifteen pages, Mr. Muirhead gives a good deal of information about Gray Geese under the following headings:—Parish, Farm, Fields on which the Geese alight; Date of arrival in Spring; ditto in Autumn; and Name and Address of Correspondent supplying the information. An illustration is given (p. 86) of Hile Moss, a picturesque sheet of water of about seventeen acres in extent, on a lonely part of Greenlaw Moor, a favourite haunt of Wild Geese, to which they resort in October and November. Mr. Muirhead

states that although it is probable that the Greylag Goose visits Berwickshire at the same season as the other two species mentioned, yet there appears to be no record of its positive occurrence in the county. The White-fronted Goose, too, "probably visits the county in small numbers in autumn and spring," but the author is able to record but a solitary instance of its appearance, *i.e.* in February, 1884, when one was shot by a keeper on the Kimmerghame estate.

A *propos* of wildfowl in Scotland, it will be of interest to quote the following list of species which are enumerated in an Act of the Scottish Parliament (16 James VI. c. 23), passed in November, 1600, "against the slaughter of wildfowles":—

"Seing in tyme of peace in all tyme bygane the said pastymes of hunting and halking were the onely means and instruments to keepe the haill Leiges bodies fra not becoming altogether effeminat . . . they discharge any persons whatsoever within this Realme in any wyse to sell or buy any fastan reid or fallowe Deare, Daes, Raes, Hares, Partridges, Moore-fowles, Black-cokes, Aith-hennes, Termigants, Wyld-dukes, Teilles, Atteilles, Goldings, Mortyms, Schidderems, Skaildraik, Herron, Butor, or any sik kynde of fowles, commonly used to be chased with Halkes, under the paine of ane hundreth pounds to be incurred alswell by the buyer as the seller."

At pp. 363–364 of this volume Mr. Muirhead gives a list of Berwickshire names for birds, but as he does not include *Aith-hen*, *Atteel*, *Golding*, *Mortym* or *Schidderem*, we must conclude either that they are now obsolete, or perhaps were never in use in this county. We should nevertheless be curious to know to what species these names were respectively applied in any part of Scotland.

The chapters on Red Grouse and Blackgame in this volume are especially interesting from the statistical information which they contain, collected by the author from ancient records and little-known histories. The Pheasant, he tells us (p. 170), is first mentioned in Scottish Acts of Parliament in 1594, but how long previously it was known there is uncertain. In the information given by our author concerning game-birds generally he seems well posted up to date, for he quotes Mr. Griffiths' experiments to test the rate of speed of Pheasants and Partridges (pp. 176, 180), and Mr. Ogilvie Grant's remarks on the distinguishing signs of the sexes in Partridges (p. 187). No instance is known to him

of the occurrence of the Red-legged Partridge in Berwickshire, and there is no record of the Great Bustard having been found in that county since the early part of the sixteenth century.

An extremely interesting chapter is that on the Dotterel, concerning which we find seven pages of statistics in tabular form, showing the various parishes in which this bird has been met with, the date of arrival and departure, and the number of individuals commonly observed in the flocks.

With the exception of those birds which stay to nest, the whole of the Woodcocks which are seen in the woods of Berwickshire during the shooting season leave for their breeding-quarters in the northern parts of Europe in March and April; while it has been observed that those which breed in the county disappear towards autumn, having probably migrated southwards. The autumnal flights of Woodcock from the north generally arrive in Berwickshire about October and November (p. 233).

Although there is no record of the nest of the Dunlin having been found in Berwickshire, yet the presumption is that this bird has bred on the moors about Longformacus, for it has been met with there high up on swampy mossy ground in the middle of July.

We have not space to follow Mr. Muirhead through his enumeration of the many kinds of wildfowl and seafowl which haunt the rocky coasts of his county, or come inland to the mosses and tarns at different seasons of the year, some to nest and rear their young, others to seek shelter and food during the autumn and winter months. Enough has been said to show the nature of the volume before us, and its varied contents. It is a work full of curious information calculated to delight the reader, whether he be naturalist or antiquary, and we heartily commend it on that account. To the collector of county bird books it will be especially acceptable, since it deals very completely with a portion of North Britain which to most naturalists has been hitherto a *terra incognita*. The delicacy of the numerous illustrations with which it is adorned renders it in this respect all the more attractive.

The Evolution of Bird-Song: with Observations on the Influence of Heredity and Imitation. By CHARLES A. WITCHELL, Author of the 'Fauna of Gloucestershire.' 8vo, pp. i-x, 1-253. London: A. & C. Black. 1896.

THE songs and cries of birds have attracted the attention of mankind from ancient times to the present day, and sportsmen, poets, and many others as well as naturalists, have considered these subjects. The references to the voices of birds, in books treating even to a limited extent of ornithology, are exceedingly numerous; but, practically, all of them are generalizations from the habits of one or two individual birds under observation. The music (as writers term the intervals of musical pitch) uttered by birds has often been mentioned with some attempt at description in notation, as in Gardiner's 'Music of Nature' (1832), Smee's 'My Garden' (1872), and especially in Cheney's 'Wood Notes Wild' (1892), which work treats at great length of this branch of the subject under discussion.

But investigation of the origin and meanings of the notes of birds has been less often attempted, and apparently with less success. The most important observations on this theme, written in the last century, were those of the Hon. Daines Barrington (Roy. Soc. Phil. Trans. vol. lxiii. 1773, pp. 249-291), which are still quoted as the most conclusive proof of the power of mimicry in perpetuating the vocal characteristics of certain song-birds. But beyond the record of his personal experiments in subjecting young birds to the influence of foster-parents of other musical species, his treatment of the voice in birds is of little value; indeed, his analysis of song itself merely resulted in an arbitrary division of "songs" from "cries," by the test of their comparative duration.

In 1833 appeared 'The Domestic Habits of Birds,' published in the "Library of Entertaining Knowledge," in which bird-song received somewhat extensive treatment; but the author of this section of the book discredited the imitativeness of our wild song-birds, even in so polyglot a species as the Sedge Warbler; and Rennie's statement that the individuals of this species which he heard even in different parts of the country, uttered not only the same notes resembling those of other birds, but also in the

same order of succession, is so contrary to what later and more careful observers have recorded, that it discounts materially the value of his other observations.

In July and August, 1890, Mr. Charles A. Witchell published in 'The Zoologist' two papers, giving certain original theories of the origin and development of the voice and of the songs of birds. The subject was then scientifically so unworked, that it was not easy for ornithologists to determine the accuracy of Mr. Witchell's records, or the value of his theories; and though six years have since elapsed, we are yet without any record of as systematic and extensive a discussion of the subject whereby his propositions can be finally tested.

In the intervening period, however, Mr. Witchell has further considered his position and elaborated his themes, which are now fully stated, though of necessity with some brevity of illustration, in the volume under notice.

In this book the author propounds a theory of the evolution of the voice in birds, and also necessarily discusses, in connection with the main theme, the influence of heredity and imitation. Although the general scheme of his earlier papers (above referred to) is here followed, the author does not travel quite so far in his conclusions; and we think he is wise in thus restricting himself to so new a field as that upon which he has entered.

The "Introduction" informs the reader of the circumstances under which the study of the subject was commenced, and briefly states how the various themes dealt with in later pages were suggested by the habits of the birds observed. We also learn somewhat of the author's method of work, and note the perseverance with which he accumulated almost daily records for a period of eighteen months, before making any comparison of the materials collected.

In Chapter I., "The Origin of the Voice," he suggests a new theory, namely, that the voice may have been of accidental origin, produced by the bodily contortions of animals during combat, and as a result of such contortions, rather than as a direct result of the excitement of the sensorium,—the cause suggested by Darwin ('Expression of the Emotions,' pp. 83, 84). Mr. Witchell adduces the Newt, as an animal which still exhibits the accidental production of the voice, first giving utterance to a vocal sound when wriggling in the grasp of an enemy, and thus

forcing air through the glottis, which in this creature, as in the Frog, is closed during the intervals of breathing.

In this place the puffing and hissing of birds are very properly considered. From original battle-cries the author passes on to alarm-notes, and in this connection we have the first suggestion that Evolution is now proceeding in the formation of a long cry, by the utterance of a shorter one many times repeated in quick succession. Instances are given of the occasional construction of such alarm-phrases by the Blackcap, Long-tailed Titmouse, Nightjar, and other birds, leading to the development of habitually long alarms, like those of the Black-bird, Mistle Thrush, and Magpie.

Chapter II. deals with the influence of combat, including rivalry and emulation; and here we note a suggestion that certain of the Finches may include in their songs sounds which indicate defiance. Hence singing during combat, as exhibited by various species, is also considered.

Chapter IV. deals with the call-note; and here we find a complaint of the lack of attention on the part of ornithologists, who, it seems, have been too ready to call any prominent note a "call-note," such, for instance, as the *pink* of the Chaffinch, which Mr. Witchell shows to be more correctly describable as a "battle-cry." It is suggested that the first call-notes were mere cries of distress inherited by the young, and retained by them as advantageous after leaving the nest. In song-birds the tones might have been "gradually affected by any recurrent prevalent sounds falling on the receptive senses of successive generations of the young."

Chapter V. deals with "the simplest songs," and these the author finds to be at present mere repetitions of call-notes uttered in varied intervals of pitch; in many more elaborate songs the call-note is still retained and frequently employed. Thus the Sky Lark, Nightingale, Goldfinch, House Sparrow, Titmice, Brown Wren, and others, utter their call-notes in their songs. The inference is that in some species the song was originally developed from mere repetitions of the call-note.

In dealing with "noticeable incidents" of bird-song, the author clears the ground of side-issues, before entering upon the more important themes of heredity and imitation. The "incidents" cover a wide range of subjects—the influence of sex,

age, time of day, weather, vehemence, size of bird, and arboreal life. Accent in song, exercise of ears or of eyes in detecting danger, necessity for leisure, flight in song, fluttering of wings as a means of address, and singing in chorus, are all dealt with in this chapter. One point claimed by the author is that a life in foliage leads to a development of hearing, because by that sense birds would most readily learn what was going on in their vicinity; also that a life in foliage is only suited to small birds, as compared with the increased sustenance to be found in larger kinds of food afforded by a more open habitat. Hence singing birds are arboreal and small. The Sky Lark is not mentioned here; but possibly the author would say that the size of the bird and its inconspicuous colouring enable it to survive, despite the conspicuous appearance it presents when singing.

The necessity of leisure for singers is claimed as a reason why laborious birds, as the Rook and Crow, do not sing; and the effects of the demands of young birds, and of enforced idleness in captivity, are here considered.

In Chapter VII. the *crux* of the whole argument—the influence of heredity—is discussed; and here, as elsewhere, the author, though traversing a good deal of ground, has felt himself obliged for want of space to cite but a few examples only in each branch of the subject. He begins by proving the absolute inheritance of the voice in certain non-singing birds, such as the Domestic Fowl, Duck, Swan, Pheasant, &c. Other inheritors of the voice are mentioned, who possess the same tones and notes whether reared artificially or naturally, but we are reminded that in some song-birds every note of the young is acquired by imitation of the parents.

Mr. Witchell traces a family resemblance in the cawing of birds of the Crow family. He finds similarity between the call-notes of several birds of the *Turdidæ*, indicating relationships between the Redwing and Blackbird, Common Thrush and Mistle Thrush, Ring Ouzel, and others. The long high distress-note of the Blackbird he finds to be used on similar occasions by the Robin. The young of the latter approximate to the Redstart, and this bird exhibits as an alarm-note a certain little whistle common to several Warblers.

Similarly the author finds the alarm-croak of the Nightingale reproduced in a modified form in several of its allies.

Among other orders of birds thus discussed are the Finches. The young Chaffinch has a note like that of the young House Sparrow, and the *pink* of the Chaffinch is heard in some other Finches. The Sparrow's *tell* cry is heard prominently in the young Greenfinch and young Brown Linnet. Many other kinds of birds are mentioned in connection with this new and hitherto practically unworked and unnoticed but valuable field for research. Mr. Witchell claims that it is rational to conclude that such family cries as those he adduces "have been employed during a much longer period than songs, which are varied locally and individually; and that the original cries of the various kinds are recorded in their danger-cries and call-notes; and that the tones of the later-developed cries, and modes of singing, are indicated in the first part of the songs, for these have the most generic characters" (p. 137).

In dealing with Variation (Chapter VIII.), it is laid down as an axiom that vocal utterance is always subject to variation. In connection with this theme, extravagance of demeanour is considered, and the progressive song of a Blackbird heard in a garden during several seasons is illustrated in notation (pp. 148, 149). Instances of variation in a House Sparrow, Robin, and Cuckoo are mentioned.

Chapter IX. treats of the influence of imitation, a twin subject to the influence of heredity, in both of which the author has practically broken new ground. Some forty kinds of birds alone are discussed in connection with this matter—a list quite beyond consideration in the space at our disposal.

But notwithstanding the extensive claims made for mimicry in the Thrush, Robin, Sky Lark, Starling, and other birds, and although Mr. Witchell claims as of imitative origin the curious alleged resemblances between the notes of certain birds and sounds made by the elements, by quadrupeds, insects, and by other birds, we do not gather that he claims that a similarity between a bird's note and any other persistent sound is due to the bird in question having deliberately tried to imitate the other sound; but that the species of bird may have been unconsciously influenced during "a long period" by the persistent sound continually falling on its sense of hearing, with the result that its cries might have been only very slightly altered in time or in tone, and this small variation being followed by the young, might

be increasingly modified in seeming imitation during ensuing generations (p. 181).

In allusion to this line of argument, the author asks (p. 228), "Is it strange that a Woodpecker should have a cry exactly like the note of its neighbour a Tree Frog (p. 188), whose cries may be a survival of the complainings of the permian epoch? Is it wonderful that in autumn the Brown Wren should particularly affect a little chirp like the chirp of its companion at that season, a cricket, whose note may have first been produced by an orthopterous ancestor in the coal period"?

The music of Bird-song is the concluding theme, and treats of the strains of various birds; but in regard to the musical notation given of the songs of the better singers, such as the Robin, Blackbird, and Blackcap, the author gives some of the strains he has heard, not as recording the whole song of any one species—which he says are impossible to record on account of their variety—but as indicating how diverse such songs really are, and how impossible it is to attempt, as is sometimes done, to give an idea of a whole song by means of a few bars of music.

Mr. Witchell has attacked a very large subject, and, as he tells us in his preface, he thought out his method of attacking it without the aid of books. The points he raises are so many, and not a few of them so new, that a considerable time must elapse before any general conclusion on the merits of his labours can be reached. It is probable that (as we feel sure he would admit) some of his positions would be found untenable in the light of the fuller investigation which his book should occasion; but, on the other hand, many of his views seem not only plausible, but are justified by a considerable amount of evidence. At any rate, he has produced a volume which enters laboriously upon an unworked field, and no one interested in the voices of wild birds and desirous to investigate the evidence of their development, should miss an opportunity of perusing it. It is to be regretted that the Bibliography was not revised, and made more complete, as it might well have been.

